REMARKS

Prior to entry of this Amendment Claims 20, 22, 23 and 30-35 were pending and under consideration. With this Amendment, Claims 20 and 30 are being amended and new Claim 36 is being added. Thus, after entry of this Amendment, Claims 20, 22, 23 and 30-36 are pending and under consideration. The amendments of the claims and the rejections raised in the Office Action are discussed in detail below.

Amendments to the Claims

Claims 20 and 30 have been amended. The term "protein target analyte" replaces the term "non-nucleic acid target analyte" in amended Claims 20 and 30. Support for the amended claims is found in the specification at pages 14-15, lines 24-6; page 16, lines 30-36; page 35, lines 11-36. No new matter is introduced by these amendments. Applicants expressly reserves the rights to reintroduce "non-nucleic acid target analyte" into this or one or more timely-filed related applications.

Claim 36 has been added. Support for the new claim is found in the specification at page 11, lines 6-14, for example. No new matter is introduced by new Claims 36.

35 U.S.C. § 112, first paragraph

Claims 20, 22, 23 and 30-35 stand rejected under 35 U.S.C. § 112, first paragraph, as allegedly failing to comply with the written description requirement. The rejection is traversed as applied to Claims 20, 22, 23 and 30-35.

Claim 20 recites an apparatus for the detection of a protein target analyte in a test sample, comprising a test chamber comprising an array of first measuring electrodes each comprising a passivation agent monolayer comprising at least a covalently attached first passivation species and a covalently attached second passivation species comprising a protein binding ligand wherein said protein binding ligand is covalently attached to said electrode via a spacer; wherein said test chamber further comprises at least one second measuring electrode; and voltage source electrically connected to said test chamber. Rejected Claim 22 and 23 depend from Claim 20.

Claim 30 recites an apparatus for the detection of a non-nucleic acid target analyte in a test sample comprising a test chamber comprising an array of electrodes each comprising a passivation agent monolayer comprising at least a covalently attached first passivation species and a covalently attached second passivation species comprising a protein binding ligand, wherein said protein binding ligand is covalently attached to said electrode via a spacer, wherein said test chamber further comprises at least one second measuring electrode and a voltage source electrically connected to said test chamber, and an electronic detector. Rejected Claim 31-35 depend from Claim 30.

The Examiner states that with their prior Amendment, Applicants changed the claim language to read on "passivation agent monolayer" replacing self assembled monolayer, and the interchangeability of the two terms is not supported by the disclosure. Office action at page 3. Further, the Examiner asserts that the specification implies that a "passivation agent" is a spacer and not a replacement for the term self assembled monolayer and requests Applicant to show support for the identical definitions of the two terms passivation agent monolayer" and self assembled monolayer. *Id.*

Applicants submit that the written description requirement of 35 U.S.C. §112 is satisfied when the disclosure, considered as a whole, reasonably conveys to skilled artisans that the inventor invented the subject matter claimed. *See, e.g., Ralston Purina Co. v. Far-Mar-Co Inc.*, 227 USPQ 177, 179 (Fed. Cir. 1985); *Vas-Cath v. Mahurkar,* 19 USPQ2d 1111, 1116 (Fed. Cir. 1991). *Ipsis verbis* description is not required. *Fujikawa v. Wattanasin*, 39 UPPQ2d 1895, 1904 (Fed. Cir. 1996). Nor must every nuance of the claims be explicitly described. *In re Alton*, 37 USPQ2d 1578, 1584 (Fed. Cir. 1996) ("If a person of ordinary skill in the art would have understood the inventor to have been in possession of the claimed invention at the time of filing, even if every nuance of the claims is not explicitly described in the specification, then the adequate written description requirement is satisfied.").

Applicants respectfully submit that the written description requirement of 35 U.S.C. § 112 is satisfied with respect to term "passivation agent monolayer" because the disclosure, considered as a whole, reasonably conveys to skilled artisans that the inventor invented the subject matter of Claims 20, 22, 23 and 30-35. First, the originally filed Claims recite the term "self-assembled monolayer" making the term part of the original disclosure and satisfying the

written description requirement. See *In re* Koller, 613 F.2d 819, 823 (CCPA 1980) ("[O]riginal claims constitute their own description."). Second, the term "passivation agent monolayer" is fully supported throughout the specification. For example, the specification describes electrodes comprising "a passavation agent, preferably in the form of a monolayer on the electrode surface". Specification at page 34, lines 1-11. Furthermore, the specification clearly describes a "passavation agent layer facilitates the maintenance of the target analyte away from the electrode surface. In addition, a passavation agent serves to keep charge carriers away from the surface of the electrode. Thus, this layer helps to prevent electrical contact between the electrodes and the electron transfer moieties, or between the electrode and charged species within the solvent." Specification at page 34, lines 13-16.

Applicant respectfully disagree with the Examiner assertion that the specification implies that a "passivation agent" *is* a spacer. Applicants assert that the specification clearly describes, that in some embodiments, a spacer *can be* a passivation agent (*See* for example, System 1, wherein F_1 and F_2 are linkages and X is a spacer that can be a conductive oligomer, passivation agent or insulator. Specification at page 14, lines 9-21).

As such, the original disclosure reasonably apprises skilled artisans that Applicants invented the subject matter of Claims 20, 22, 23 and 30-35. Accordingly, Applicant requests that the rejection of Claims 20, 22, 23 and 30-35 under 35 U.S.C. § 112, first paragraph be withdrawn.

Rejection of Claims 20, 30 and 34 under 35 U.S.C. § 102(b)

Claims 20, 30 and 34 stand rejected under 35 USC § 102(b) as anticipated by *Hollis et al.* (WO 93/22678) hereinafter "*Hollis*".

Applicants traverse this rejection on the ground that the reference fails to teach all of the limitations in the rejected claims. To anticipate a claim under 35 U.S.C. § 102(b), a reference must teach every element of the rejected claim. See MPEP § 2131. A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, at 631 (Fed. Cir. 1987).

The Examiner asserts that *Hollis* discloses an apparatus including a test chamber with an array of first measuring electrodes (test sites), a passivation agent monolayer, a binding ligand covalently attached to the electrode *via* a spacer, a voltage source and an electronic detector. Office action at page 4.

All of the claims subject to this rejection include a limitation concerning a passivation agent monolayer. *Hollis* does not teach a passivation agent monolayer, a fact admitted by the Examiner. Office action at page 6 ("Hollis *et al.* (Wo 93/22678) differ from the instant invention in failing to specifically teaching[sic] passivation agent monolayers"). Accordingly, Applicants submit that the pending claims are not anticipated by *Hollis* under 35 USC §102(b) and respectfully request withdrawal of the rejection of Claim 20, 30 and 34 under 35 U.S.C. § 102(b).

Rejection of Claims 22-23 and 31-33 under 35 USC § 103(a)

Claims 22-23 and 31-33 stand rejected under 35 U.S.C. § 103 (a) as allegedly unpatentable over *Hollis*, in view of Kayyem *et al.* US Patent No. 6,221,583 (hereinafter "*Kayyem*"), and in further view of Kossovsky *et al.* US Patent No. 5,585,646 (hereinafter "*Kossovsky*"). The rejection is traversed as applied to Claims 22-23 and 31-33.

Applicants respectfully point out that Claims 22-23 and 31-33 depend from Claim 20 and Claim 30, respectively. Applicants assert that dependent Claims 22-23 and 31-33 are nonobvious under § 103 (a) because independent Claim 20 and Claim 30 are nonobvious. *See In re Fine*, 837 F.2d 1071, 1074 (Fed. Cir. 1988)"[d]ependent claims are nonobvious under section 103 if the independent claims from which they depend are nonobvious; *See also Hartness Int'l, Inc. v. Simplimatic Eng'g Co .*, 819 F.2d 1100, 1108, (Fed. Cir. 1987) (dependent claim was nonobvious (and novel) because it contained all the limitations of the independent claim plus a further limitation).

In addition, Applicants respectfully assert that *Kossovsky* is non-analogous art. In order to rely on a reference as a basis for rejection, the reference must either be in the field of Applicant's endeavor or, if not, then be reasonably pertinent to the particular problem with which the inventor was concerned. *In re Oetiker*, 977 F.2d 1443, 1446 (Fed. Cir. 1992); *See also Wang*

Laboratories Inc. v. Toshiba Corp., 993 F.2d 858 (Fed. Cir. 1993); and *State Contracting & Eng'g Corp. v. Condotte America, Inc.*, 346 F.3d 1057, 1069, (Fed. Cir. 2003). *Kossovsky* teaches the use of a biochemical stabilization layer deposited on the surface of a *semiconductor* to which is bound an electronically active biochemical molecule. The biochemical stabilization layer is made of a polyhydroxy oligomer. There is no teaching in *Kossovsky*, regarding the use of bioelectronic devices for the *detection of target analytes* in samples. As such *Kossovsky* is not "analogous prior art" for the purpose of analyzing the alleged obviousness of the subject matter at issue. Accordingly, the *Kossovsky* reference is not a proper 35 U.S.C. §103(a) reference, and the *Kossovsky* reference should be withdrawn.

Section 103(a) precludes the grant of a patent only if "the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which the subject matter pertains." 35 U.S.C. § 103(c). The Examiner bears the initial burden of establishing a case of *prima facie* obviousness. *In re Bell*, 26 USPQ2d 1529, 1530 (Fed. Cir. 1993); *In re Fine*, 5 USPQ2d 1596, 1598 (Fed. Cir. 1998); MPEP § 2142. If the Examiner does not establish a *prima facie* case, the Applicant is under no obligation to submit evidence of nonobviousness, and the rejection must be withdrawn. *Id.*

To establish a proper *prima facie* case, three criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine the reference teachings. Second, there must be a reasonable expectation that the modification or combination would be successful. Finally, the prior art reference (or references when combined) must teach all the limitations of the rejected claims. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based upon Applicant's disclosure. *In re Vaeck*, 20 USPQ2d 1438 (Fed. Cir. 1991), *citing In re Dow*, 5 USPQ2d 1529 (Fed. Cir. 1988); MPEP § 2142. Thus, if all of the elements of an invention are found in a combination of prior art references, a proper analysis under Section 103(a) requires consideration of two factors: (1) whether the prior art would have suggested to those of ordinary skill in the art that they should make the claimed composition or device, or

carry out the claimed process;[1] and (2) whether the prior art would also have revealed that in so making or carrying out, those of ordinary skill would have had a reasonable expectation of success. *Noelle v. Lederman*, 69 USPQ2d 1508, 1515 (Fed. Cir. 2004).

Rejected Claims 22-23 and 31-33 depend from Claim 20 and 30, respectively. As mentioned above, independent Claims 20 and 30 require a "passivation agent monolayer". The *Hollis* reference is silent in this regard; it does not teach or suggest a passivation agent monolayer. This deficiency is fatal to the rejection of Claims 22-23 and 31-33 under 35 USC § 103 (a). The *Hollis* reference combined with the *Kayyem* and *Kossovsky* fails to teach each and every limitation of the rejected amended claims. Accordingly, *prima facie* obviousness is not established and the rejection of Claims 22-23 and 31-33 under 35 U.S.C. §103(a) should be withdrawn.

The Examiner asserts that one skilled in the art would have been motivated to employ insulators and or conductors (oligomers) to control electron transfer in binding systems like the one of Hollis *et al.* to ensure optimal working ranges for precise and accurate evaluation of an analyte of interest. Office action at page 8. Applicants respectfully traverse this finding to prevent this statement from becoming admitted prior art. Applicant requests that the assertions be supported by proper evidence in accordance with MPEP § 2144.03. See also, *In re Lee*, 61 USPQ2d 1430, 1434-35 (Fed. Cir. 2002); *In re Zurko*, 59 USPQ2d 1693, 1697 (Fed. Cir. 2001) (holding that general conclusions concerning what is "basic knowledge" or "common sense" to one of ordinary skill in the art without specific factual findings and some concrete evidence in the record to support these findings will not support an obviousness rejection.)

In view of the lack of teaching or suggestion of all claimed elements and a lack of motivation for one skilled in the art to modify the disclosure of *Hollis*, Applicants submit that Claim 22-23 and 31-33, are unobvious over *Hollis*, in view of *Kayyem*, and in further view of *Kossovsky*. Accordingly, Applicants respectfully request that the Examiner withdraw the rejection of Claims 22-23 and 31-33.

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1 The law is well-settled that the mere fact that references *can* be combined or modified does not render the resultant combination obvious *unless the prior art also suggests the desirability of the combination. In re Mills*, 16 USPQ2d 1430, 1432 (Fed. Cir. 1990); *In re Fritsch*, 23 USPQ2d 1780 (Fed. Cir. 1992 (emphases supplied).

Rejection of Claim 35 under 35 USC § 103(a)

Claim 35 stands rejected under 35 USC § 103 (a) as allegedly unpatentable over *Hollis*, in view of Wohlstadter *et al.* US Patent No. 6,090,545 (hereinafter "*Wohlstadter*"). The rejection is traversed as applied to Claim 35.

Applicants respectfully assert that *Wohlstadter* is non-analogous art. As discussed above, in order for the Examiner to rely on a reference as a basis for rejection of an Applicant's invention, the reference must either be in the field of Applicant's endeavor or, if not, then be reasonably pertinent to the particular problem with which the inventor was concerned. Here, the target analytes of *Wohlstadter* are detected based on electrochemiluminescence (ECL) a form of *light emitting* chemiluminescence. There is no teaching in *Wohlstadter* of a processor configured to receive *electrochemical signals*. As such *Wohlstadter* is not analogous prior art for the purpose of analyzing the alleged obviousness of the subject matter at issue. Accordingly, the *Wohlstadter* reference is not a proper 35 U.S.C. §103(a) reference, and the *Wohlstadter* reference should be withdrawn.

The Examiner assert that *Hollis* differs from the instant invention in failing to specifically teach a processor for data analysis in their device, and that *Wohlstadter* shows an embodiment in which multi-array device includes a microprocessor containing a controller means for generating an analyzing electrochemiluminescence signals. Office action at page 8.

Claim 35 reads an apparatus according to claim 20 or 30 further comprising a processor coupled to said electrodes and configured to receive an output signal. As mentioned above, independent Claims 20 and 30 require a binding ligand "passivation agent monolayer". The *Hollis* reference is silent in this regard; it does not teach or suggest passivation agent monolayer. The *Hollis* reference combined with the *Wohlstadter* fails to teach each and every limitation of the dependent Claim 35.

As described above, unlike the present invention, the target analytes of *Wohlstadter* are detected by *light emitting* chemiluminescence, rather than *electrochemical detection*. As such the *Wohlstadter* fails to teach or suggest a processor configured to receive an output signal as required by Claim 35. Thus, the requirement that the prior art references teach or suggest all the claim limitations is not met. Accordingly, Applicants respectfully request the rejection of Claim 35 be withdrawn.

CONCLUSION

Based on the foregoing, Applicants submit Claims 20, 22, 23 and 30-36 are in condition for allowance. An early indication of the same is therefore respectfully requested. If any matters can be resolved by telephone, the Examiner is invited to call the undersigned at the telephone number listed below. No fees beyond those being submitted concurrently herewith are believed due. However, the commissioner is authorized to charge any additional required fees, or credit any overpayment to Deposit Account No. 50-2319 (Our File No.: 463037-15; Our Docket No.: A-64559-3). This paper is filed under 37 C.F.R. section 1.34.

Respectfully submitted,
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